What is claimed is:

1. An interconnecting neural network system comprising:

a neural network unit that includes a plurality of neurons, each of the neurons outputting an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function; and

a network control unit that constructs an artificial neural network structure by interconnecting neurons relating to each other among the neurons in the neural network unit via a weight,

wherein each of the neurons in the neural network unit outputs an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function when the each neuron is excited by the input vector applied from an outside, and outputs a pseudo excitation strength obtained based on an excitation strength output from the other neuron when the each neuron is excited in a chain reaction to excitation of the other neuron connected to the each neuron.

2. The interconnecting neural network system according to claim 1, wherein each neuron in the neural network unit outputs the pseudo excitation strength and also outputs the centroid vector of the each neuron when the each neuron is excited in a chain reaction to the excitation of the other neuron connected to the each neuron.

3. The interconnecting neural network system according to claim 1, wherein the network control unit interconnects the neurons relating to each other among the neurons in the neural network unit, based on an order of the neurons added or excited at time series in association with a plurality of input vectors applied to the neural network unit from the outside.

4. The interconnecting neural network system according to claim 1, wherein the network control unit trains the weight that connects the neurons to each other, based on the excitation strength of the each neuron in the neural network unit.

5. The interconnecting neural network system according to claim 1, wherein the network control unit removes the each neuron at a predetermined timing determined based on the excitation strength of the each neuron in the neural network unit.

6. The interconnecting neural network system according to claim 1, wherein the each neuron in the neural network unit is an intermediate layer neuron using, as the centroid vector, centroid data in a matrix form in light of time series changes, and the each intermediate layer neuron is connected to an output layer neuron that outputs a change in the excitation strength output from the each intermediate layer neuron at time series.

7. The interconnecting neural network system according to claim 1, wherein the kernel function employed in the each neuron in the neural network unit includes a radial basis function.

8. A method of constructing an interconnecting neural network structure, the method comprising the steps of:

preparing an artificial neural network structure including a plurality of neurons, each of the neurons outputting an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function, the neurons relating to each other interconnected in the artificial neural network structure

via a weight; and

training the weight that connects the neurons to each other, based on the excitation strength of the each neuron.

9. The method according to claim 8, wherein, in the step of preparing the artificial neural network structure, the neurons relating to each other are interconnected in the artificial neural network structure based on an order of the neurons added or excited at time series in association with a plurality of input vectors applied from an outside.

10. The method according to claim 8, further comprising a step of removing the each neuron at a predetermined timing determined based on the excitation strength of the each neuron.

11. The method according to claim 8, wherein the kernel function employed in the each neuron includes a radial basis function.

12. A computer readable recording medium storing an interconnecting neural network structure construction program that allows a computer to execute the method according to claim 8.

13. A method of constructing a self-organizing neural network structure including a plurality of neurons, each of the neurons outputting an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function, the neurons relating to each other being autonomously connected in the self-organizing neural network structure based on the input vector, the method comprising:

a first step of adding a neuron, which has an input vector as a centroid vector for a kernel function, into

the self-organizing neural network structure as a new neuron based on an input vector that is input first from an outside; and

a second step of repeating following processings (a) to (c), each of the processings being based on an input vector that is an n^{th} input vector from the outside, where n is an integer equal to or greater than 2:

(a) the processing of calculating excitation strengths of all the neurons in the self-organizing neural network structure based on the n^{th} input vector input from the outside;

(b) the processing of adding a neuron, which has the n^{th} input vector as a centroid vector for a kernel function, into the self-organizing neural network structure as a new neuron in case that it is determined by the processing (a) that there is no neuron excited such that the excitation strength thereof exceeds a predetermined threshold, among one or a plurality of neurons in the self-organizing neural network structure; and

(c) the processing of performing both of or one of formation of a weight that connects the neurons, and training of the formed weight based on the excitation strengths of the neurons in the self-organizing neural network structure.

14. The method according to claim 13, wherein, in the second step, a processing (d) of removing a neuron determined to be unnecessary based on the excitation strengths of the neurons in the self-organizing neural network structure is further performed.

15. The method according to claim 13, wherein each of the neurons in the self-organizing neural network structure holds a class label relating to a final output, and, in the processing (c) in the second step, only in case that the class label held by the each neuron in the

self-organizing neural network structure is identical, both of or one of the formation of the weight that connects the neurons, and the training of the formed weight is performed based on the excitation strengths of the neurons.

16. The method according to claim 13, wherein the neurons in the self-organizing neural network structure have a single modality.

17. The method according to claim 13, wherein the neurons in the self-organizing neural network structure have a plurality of modalities different from one another.

18. The method according to claim 13, wherein the kernel function employed in the each neuron includes a radial basis function.

19. A computer readable recording medium storing an interconnecting neural network structure construction program that allows a computer to execute the method according to claim 13.

20. An interconnecting neural network system comprising:

a plurality of intermediate layer neurons, each of the intermediate layer neurons outputting an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function, and each of the intermediate layer neurons using centroid data in a matrix form in light of time series changes as the centroid vector; and

an output layer neuron connected to each of the intermediate layer neurons and outputting a change in the excitation strength output from the each intermediate layer neuron at time series.

21. The interconnecting neural network system according to claim 20, wherein the kernel function employed in the each intermediate layer neuron includes a radial basis function.